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Enhancement of quality of Oomycetes in the NARO Genebank (MAFF Collection)

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Purpose: In the NARO Genebank (MAFF), approximately 1,200 Oomycetous strains are preserved. Confirming the validity of the scientific name of each strain, as well as preserving the strains for long-term with high viability, is crucial for culture collection. The purpose of our study is to increase reliability and utilization by enhancing the quality of Oomycetes in our collection.

Methods: 1) Evaluation of the scientific names. The COX1 (barcode region) and ITS sequences were used for the phylogeny. Morphological observation was also conducted as needed. The name of each strain was evaluated by the results, and also based on the latest taxonomy. 2) Development of a new technique for preservation. Some Oomycetous strains which were known for its low viability during storage were co-cultured with rapeseeds or sesame seeds on PDA or CMFA plates. The infested seeds were used as substrates for freeze-preservation or vitrification.

Results and conclusions: 1) More than 260 strains were re-identified, and about 130 strains were updated by the latest taxonomy. All of sequences determined were stored on the Microorganisms Database for anyone to use. 2) Viability of many strains were much improved compared with the general method using agar discs as substrates, although conditions representing the highest viability were varied depending on the strains. To minimize spending effort, more versatile condition should be selected and applied for culture collection. Anyway, we believe that our Oomycetous collection has become taxonomically more reliable. Continuous updating of the database and effort to preserve the strains more stable is still challenging.